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(54) Optical data storage system with multiple rewritable phase-change recording layers

(57) A multiple recording layer rewriteable phase-change optical disk (12) and disk drive uses a reverse writing type of reversible phase-change material as the recording layer (53) nearest the incident laser light. The disk has a light-transmissive substrate (50) onto which the laser light is incident. The substrate supports at least two spatially-separated multilayer recording stacks (90, 92), each stack including an active recording layer (53, 64) of reversible or rewriteable phase-change material. The recording stack (90) located nearest the substrate (50) on which the laser light is incident includes a reverse writing type of reversible phase change material, i.e., a phase-change material with an amorphous starting phase that is recorded onto by laser heating that converts data regions to the crystalline phase. This first recording layer (50) has a dielectric layer (51) in contact with it that has a high index of refraction relative to the adjacent recording layer and that acts as an optical interference film to provide a constructive optical interference effect in the recording stack. The optical interference film optimizes the contrast, reflectivity, and transmissivity of the recording stack. The optical interference film is also nonabsorbing so that laser light can pass through it to focus on a recording layer (64) in a farther recording stack (92). This allows the farther recording layer to be written using reasonable laser power.

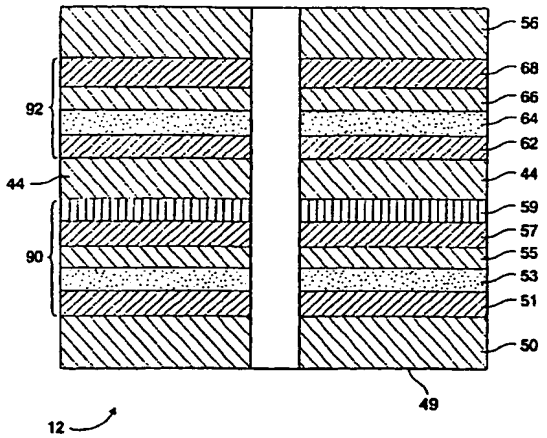

FIG. 5

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 97 30 3518

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